

FIXED DIP DELAY LINE

$T_D/T_R = 10$

(SERIES 2211)



FEATURES

- High bandwidth ($T_D/T_R = 10$)
- Low profile
- Epoxy encapsulated
- Meets or exceeds MIL-D-23859C

PACKAGES

| | | | | | |
|-----|----|----|-----|----------------------|---------------|
| N/C | 1 | 24 | N/C | 2211-xxz | (DIP) |
| IN | 2 | 23 | OUT | 2211-xxzC4 | (Gull-Wing) |
| N/C | 3 | 22 | N/C | xx = Delay (T_D) | |
| N/C | 4 | 21 | N/C | z = Impedance Code | |
| N/C | 5 | 20 | N/C | | |
| N/C | 6 | 19 | N/C | | |
| N/C | 7 | 18 | N/C | | |
| N/C | 8 | 17 | N/C | | |
| N/C | 9 | 16 | N/C | | |
| N/C | 10 | 15 | N/C | | |
| N/C | 11 | 14 | N/C | | |
| GND | 12 | 13 | N/C | IN | Signal Input |
| | | | | OUT | Signal Output |
| | | | | GND | Ground |

PIN DESCRIPTIONS

FUNCTIONAL DESCRIPTION

The 2211-series device is a fixed, single-input, single-output, passive delay line. The signal input (IN) is reproduced at the output (OUT) with a delay (T_D) given by the device dash number. The characteristic impedance of the line is given by the letter code that follows the dash number (See Table). The rise time (T_R) of the line is 10% of T_D , and the 3dB bandwidth is given by $3.5 / T_D$.

SERIES SPECIFICATIONS

- Dielectric breakdown: 50 Vdc
- Distortion @ output: 10% max.
- Operating temperature: -55°C to +125°C
- Storage temperature: -55°C to +125°C
- Temperature coefficient: 100 PPM/°C

DASH NUMBER SPECIFICATIONS

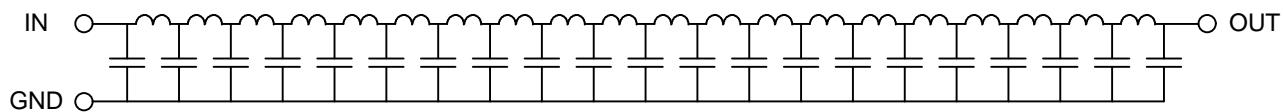
| Part Number | T_D (ns) | T_R (ns) | Imped. (Ω) | R_{DC} (Ω) |
|-------------|-----------------|------------|------------|--------------|
| 2211-40C | 40.0 ± 2.0 | 4.0 | 200 | 7.0 |
| 2211-80C | 80.0 ± 4.0 | 8.0 | 200 | 8.0 |
| 2211-120C | 120 ± 6.0 | 12.0 | 200 | 10.0 |
| 2211-200C | 200 ± 10.0 | 20.0 | 200 | 13.0 |
| 2211-300C | 300 ± 15.0 | 30.0 | 200 | 12.0 |
| 2211-400C | 400 ± 20.0 | 40.0 | 200 | 15.0 |
| 2211-500C | 500 ± 25.0 | 50.0 | 200 | 17.0 |
| 2211-600C | 600 ± 30.0 | 60.0 | 200 | 23.0 |
| 2211-800C | 800 ± 40.0 | 80.0 | 200 | 38.0 |
| 2211-50D | 50.0 ± 2.5 | 5.0 | 250 | 7.0 |
| 2211-100D | 100 ± 5.0 | 10.0 | 250 | 10.0 |
| 2211-150D | 150 ± 7.5 | 15.0 | 250 | 12.0 |
| 2211-200D | 200 ± 10.0 | 20.0 | 250 | 22.0 |
| 2211-250D | 250 ± 12.5 | 25.0 | 250 | 21.0 |
| 2211-300D | 300 ± 15.0 | 30.0 | 250 | 23.0 |
| 2211-400D | 400 ± 20.0 | 40.0 | 250 | 26.0 |
| 2211-500D | 500 ± 25.0 | 50.0 | 250 | 30.0 |
| 2211-600D | 600 ± 30.0 | 60.0 | 250 | 37.0 |
| 2211-800D | 800 ± 40.0 | 80.0 | 250 | 41.0 |
| 2211-1000D | 1000 ± 50.0 | 100 | 250 | 47.0 |
| 2211-200G | 200 ± 10.0 | 20.0 | 500 | 20.0 |
| 2211-300G | 300 ± 15.0 | 30.0 | 500 | 37.0 |
| 2211-400G | 400 ± 20.0 | 40.0 | 500 | 40.0 |
| 2211-500G | 500 ± 25.0 | 50.0 | 500 | 45.0 |
| 2211-600G | 600 ± 30.0 | 60.0 | 500 | 52.0 |
| 2211-800G | 800 ± 40.0 | 80.0 | 500 | 80.0 |
| 2211-1000G | 1000 ± 50.0 | 100 | 500 | 100 |
| 2211-1200G | 1200 ± 60.0 | 120 | 500 | 110 |
| 2211-1500G | 1500 ± 75.0 | 150 | 500 | 130 |
| 2211-2000G | 2000 ± 100 | 200 | 500 | 156 |

DASH NUMBER SPECIFICATIONS

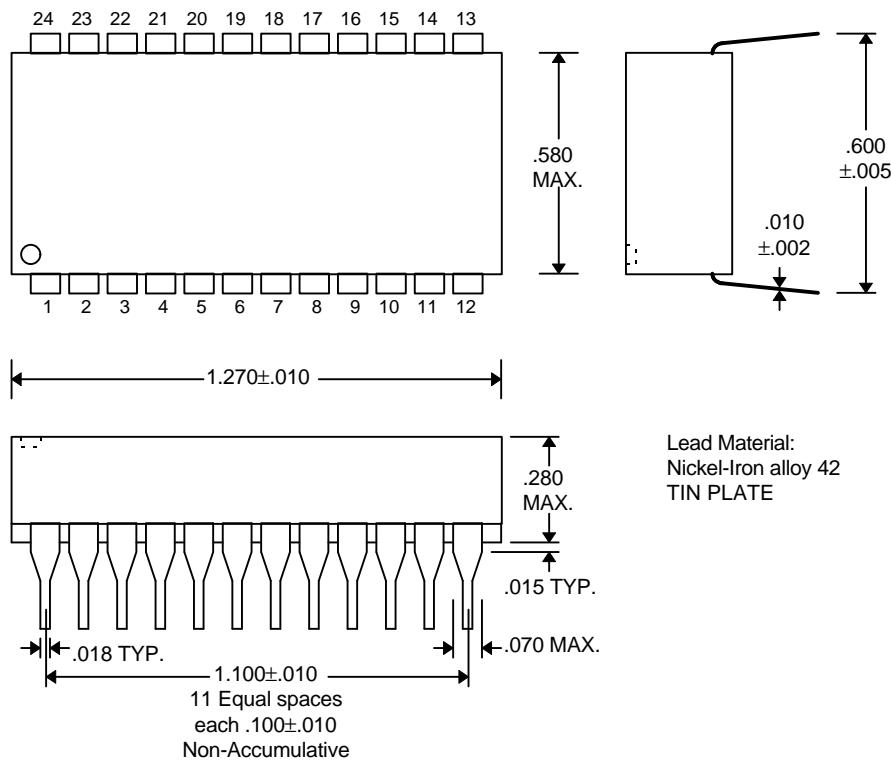
| Part Number | T_D (ns) | T_R (ns) | Imped. (Ω) | R_{DC} (Ω) |
|-------------|----------------|------------|------------|--------------|
| 2211-50A | 50.0 ± 2.5 | 5.0 | 50 | 3.2 |
| 2211-60A | 60.0 ± 3.0 | 6.0 | 50 | 3.6 |
| 2211-80A | 80.0 ± 4.0 | 8.0 | 50 | 5.0 |
| 2211-100A | 100 ± 5.0 | 10.0 | 50 | 6.0 |
| 2211-150A | 150 ± 7.5 | 15.0 | 50 | 6.0 |
| 2211-200A | 200 ± 10.0 | 20.0 | 50 | 7.0 |
| 2211-50B | 50.0 ± 2.5 | 5.0 | 100 | 6.0 |
| 2211-60B | 60.0 ± 3.0 | 6.0 | 100 | 6.0 |
| 2211-80B | 80.0 ± 4.0 | 8.0 | 100 | 6.5 |
| 2211-100B | 100 ± 5.0 | 10.0 | 100 | 7.0 |
| 2211-150B | 150 ± 7.5 | 15.0 | 100 | 8.0 |
| 2211-200B | 200 ± 10.0 | 20.0 | 100 | 8.5 |
| 2211-300B | 300 ± 15.0 | 30.0 | 100 | 11.0 |
| 2211-400B | 400 ± 20.0 | 40.0 | 100 | 12.0 |

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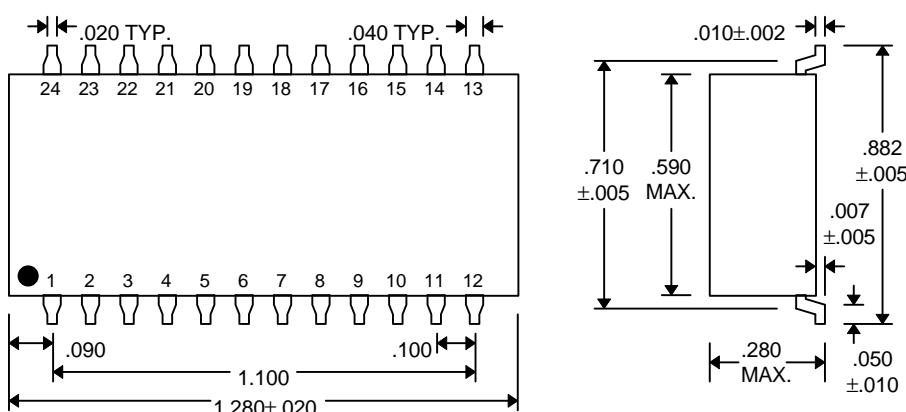
FUNCTIONAL DIAGRAM



PACKAGE DIMENSIONS



DIP (2214-xxz)



Gull-Wing (2214-xxzC4)

PASSIVE DELAY LINE TEST SPECIFICATIONS

TEST CONDITIONS

INPUT:
Ambient Temperature: $25^{\circ}\text{C} \pm 3^{\circ}\text{C}$
Input Pulse:

High = 3.0V typical

Low = 0.0V typical

Source Impedance:

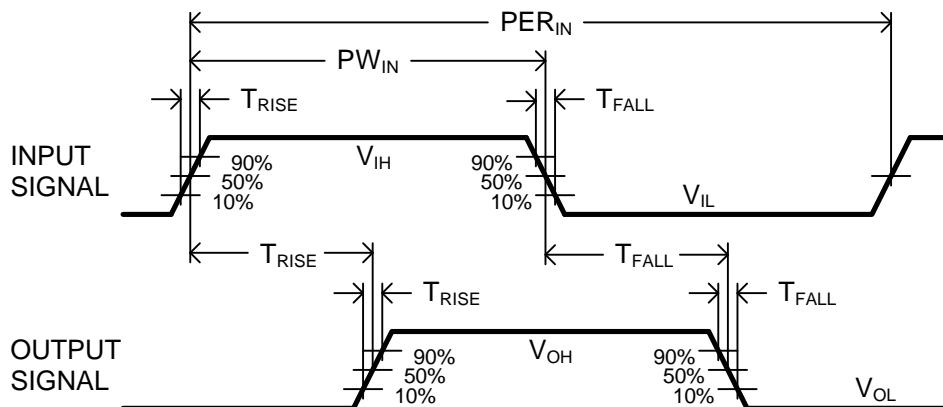
50Ω Max.

Rise/Fall Time:

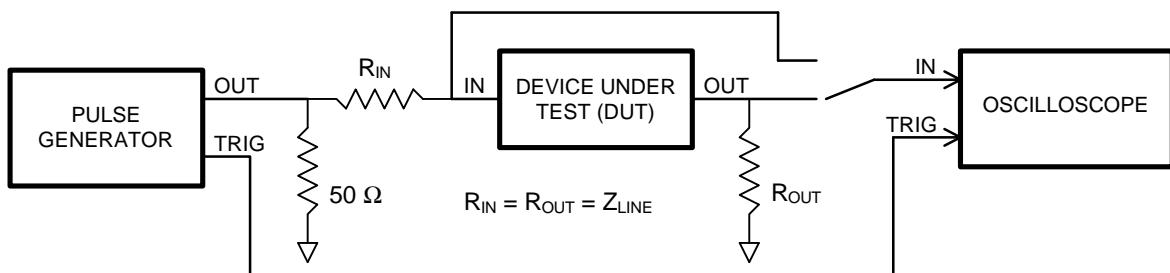
3.0 ns Max. (measured at 10% and 90% levels)

Pulse Width ($T_D \leq 75\text{ns}$): $PW_{IN} = 100\text{ns}$
Period ($T_D \leq 75\text{ns}$): $PER_{IN} = 1000\text{ns}$
Pulse Width ($T_D > 75\text{ns}$): $PW_{IN} = 2 \times T_D$
Period ($T_D > 75\text{ns}$): $PER_{IN} = 10 \times T_D$
OUTPUT:
 R_{load} : $10\text{M}\Omega$
 C_{load} : 10pf
Threshold: 50% (Rising & Falling)

NOTE: The above conditions are for test only and do not in any way restrict the operation of the device.



Timing Diagram For Testing



Test Setup